



PD 96065

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of :  
David M. Creighton : Group Art Unit 3729  
Serial No. 09/083,298 : Examiner: Trinh, Minh H.  
Filed: 05/22/1998 : Date: August 31, 2004  
For: SYSTEM AND METHOD FOR INTERCONNECTING CIRCUIT BOARDS  
IN A STACKED CONFIGURATION

**APPEAL BRIEF**

Commissioner of Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicant files its Appeal Brief in triplicate, together with the required fee. A Notice of Appeal and fee are filed concurrently.

Real Party in Interest

The Real Party in Interest is Raytheon Company.

Related Appeals and Interferences

Applicant is not aware of any related appeals and/or interferences.

Status of Claims

Claims 1 – 11 were filed.

During prosecution, Claims 1 and 4 - 10 were amended, and Claims 2, 3, and 11 were canceled.

09/15/2004 MAHMED1 00000034 500616 09083298

02 FC:1402 330.00 DA

Claims 1 and 4 – 10 are pending and all are rejected. All of these claims are appealed.

A copy of the appealed claims is found in the Appendix.

### Status of Amendments

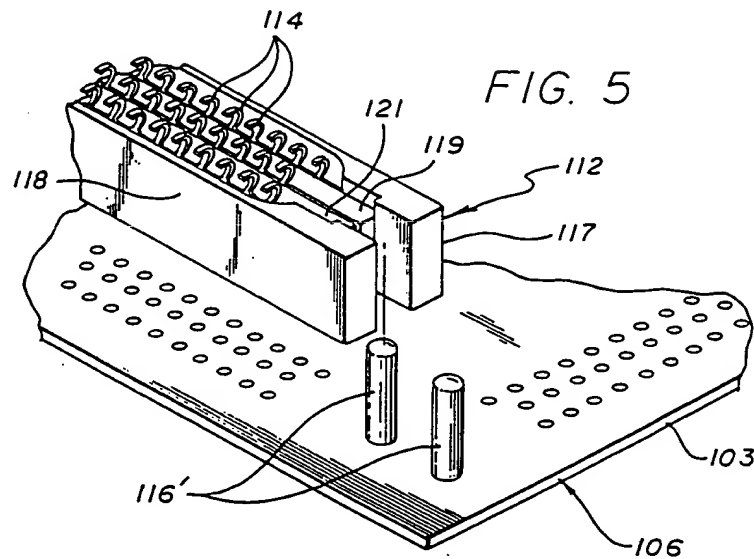
An amendment canceling claim 11 was filed and entered after final rejection.

### Summary of Invention

The present invention addresses a need in the art for a system to provide solderless electrical connections between substrates or circuit cards arranged in a stacked configuration. The elements of the invention are defined in claim 1, which reads (underscored for emphasis):

1. An assembly for providing solderless electrical connection between first and second substrates aligned in a stacked configuration, said assembly comprising:
  - a conductor assembly having at least one elongate conductor adapted to engage a first electrical contact on said first substrate on one end and a second electrical contact on said second substrate on a second end thereof, said conductor having a three-bend hook shape at both the first and second ends thereof to provide a spring force on both the first and second ends thereof and
  - means for retaining said conductor in abutting contact with said first and second contacts and thereby effect a solderless electrical connection between said first contact on said first substrate and said second contact on said second substrate.

An embodiment of the invention, as shown in FIG. 5 on the following page, is comprised of a plurality of conductors 114 retained in a three-piece housing 117, 118, 119. During assembly of the substrates (circuit cards), the housing is located against pins 116 which ensures that the conductors 114 align with the pads 130 on the substrate.



The ends of the elongate conductors are formed into three-bend hook shapes as shown in FIG. 7 and described at page five, line 17, to page 6, line 12, of the application. The ends of each conductor 114 are formed with three bends 123, 125, 127 which act in combination to provide both a spring force and a wiping action at each end of conductor. The spring force ensures good electrical connection in presence of some variation in the flatness of the circuit cards and vibration. Additionally, the three-bend hook shape ensures that Bend 127, which forms the surface where the conductor contacts a pad, moves against, or "wipes" the surface of the pad to penetrate any surface contamination that could interfere with the electrical contact. Such wiping action is known to be critical to electrical connectors.

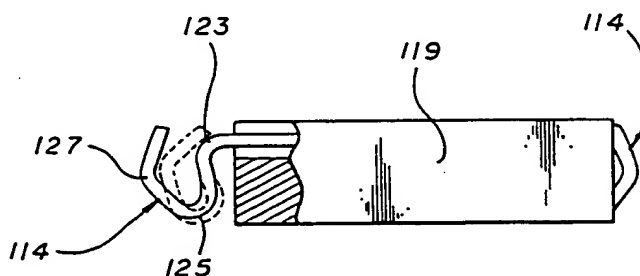


FIG. 7

Issues

Issue 1: Are Claims 1 and 4 – 10 properly rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 5,013,255 to Juret.

Issue 2: Is Claim 10 properly rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 5,378,160 to Yumibe.

Grouping of Claims

Claims 4-9 stand or fall with Claim 1.

Claim 10 stands alone.

Argument

Issue 1

Claims 1 and 4 – 10 stand rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 5,013,255 to Juret.

Juret describes a connector having a slot for receiving an electronic memory card. Within this connector, as shown in FIG. 1, each of a plurality of elongate conductors 32, 34 has a u-shaped hook at one end to provide a surface to contact the memory card. A spring force is provided on the contact by means of the cantilevered length of the elongate conductor, rather than by the bent hook shape. A wiping action is provided at the point of contact by the motion of the memory card as it is inserted into the connector. The second end of each of the conductors is a solder tail, which may be either straight or bent (see FIG's 15, 16, 17) depending on how the connector is to

be attached to the accompanying circuit card (not illustrated). Note that there is no spring force required or provided at the soldered ends of the conductors.

In the final office action of June 14, 2004, Examiner contended that FIG. 1 of Juret shows "a plurality of elongate conductor 32,34, and both ends of these conductors being formed in a hook shape". Examiner asserts that the limitation of "the conductors have hook shapes at both ends" is met by Juret.

However, the present application has no such claim limitation. Claim 1 of the application is clearly drawn to an assembly comprising elongate conductors having, not merely a "hook shape", but a "3-bend hook shape at both the first and second ends thereof to provide a spring force on both the first and second ends thereof". The fact that the conductors of Juret have bends at both ends is not sufficient to anticipate the invention. Since Juret does not have the advantageous 3-bend hook shape at either end of the conductors and does not provide a spring force at the second end of the conductors, applicants respectfully submit that Juret does not anticipate the present invention.

## Issue 2

Claim 10 also stands rejected as anticipated by U.S. Patent No. 5,378,160 to Yumibe.

FIG. 5 of Yumibe shows a conductor having four bends distributed along its length. The two upper bends 46, 52 act in concert to provide an upward spring force and a wiping action at one end of the conductor. The lower two bends position the conductor 28 for reflow soldering to a pad 32 on circuit card 30. Although Yumibe employs multiple bends at one end of a conductor to provide a spring force and wiping action, Yumibe does not teach the advantageous 3-bend hook shape at either end of the conductor. In addition, Yumibe does not teach the means or need to provide a spring force

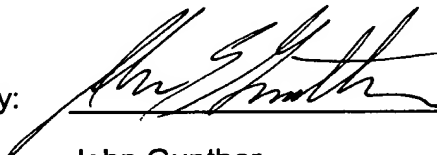
at both ends of the conductors. Thus the applicants respectfully submit that Yumibe does not anticipate the present invention.

Summary and Conclusion

As discussed above, a key feature of the present invention is the advantageous 3-bend hook shape at both ends of elongate conductors to provide a spring force at both ends thereof. Neither Juret or Yumibe anticipate this feature. This is not at all surprising, since neither Juret or Yumibe (nor any of the other references cited in the previous office actions) is intended to perform the function of the present invention to provide solderless connections between substrates.

Applicants respectfully submit that the claims of this patent are allowable over the cited prior art singly or in combination, and requests that the Board reverse the rejections.

Respectfully submitted,  
David M. Creighton *et al.*

By: 

John Gunther  
Agent for Applicants  
Registration No. 43,649

Raytheon Company  
EO/E4/N119  
P.O. Box 902  
El Segundo, CA 90245-0902  
(310) 647-3723

APPENDIX

Clean Copy of Appealed Claims

1. (Previously presented) An assembly for providing solderless electrical connection between first and second substrates aligned in a stacked configuration, said assembly comprising:

a conductor assembly having at least one elongate conductor adapted to engage a first electrical contact on said first substrate on one end and a second electrical contact on said second substrate on a second end thereof, said conductor having a three-bend hook shape at both the first and second ends thereof to provide a spring force on both the first and second ends thereof and

means for retaining said conductor in abutting contact with said first and second contacts and thereby effect a solderless electrical connection between said first contact on said first substrate and said second contact on said second substrate.

2. Canceled

3. Canceled

4. (Previously presented) The assembly of Claim 1 wherein said conductor is constrained by a dielectric between the ends thereof.

5. (Previously presented) The assembly of Claim 4 wherein said conductor assembly includes a plurality of conductors.

6. (Previously presented) The assembly of Claim 5 wherein said conductor assembly is retained within an elongate housing.

7. (Previously presented) The assembly of Claim 6 wherein said housing is retained within a frame.

8. (Previously presented) The assembly of Claim 7 wherein said housing is retained within said frame by at least one pin at each end thereof.

9. (Previously presented) assembly of Claim 8 wherein said pin is retained by said frame.

10. (Previously presented) A high density electrical assembly adapted to make solderless electrical contacts between plural circuit boards aligned in a stacked configuration, said assembly comprising:

a conductor assembly having plural elongate conductors adapted to engage a first electrical contact on a first circuit board on one end and a second electrical contact on a second circuit board on a second end thereof, each conductor having a three-bend hook shape at both the first and second ends thereof to provide a spring force on both the first and second ends thereof and constrained by a dielectric between the ends thereof and

means for retaining each conductor in abutting contact with said first and second contacts and thereby effect a solderless electrical connection between said first contact on said first substrate and said second contact on said second substrate.

11. (Canceled)